

BE IT KNOWN that **WE**, Kurt **LEUTNER** and Dietrich **BUSCH**, citizens of Germany, whose post office addresses and residencies are, respectively, Am Schinnergraben 81, 55129 Mainz, Germany; and Palmgarten 15, 56288 Kastellaun, Germany, have invented certain new and useful improvements in a

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MICROWAVE UNIT DOOR WITH VIEWING WINDOW

Of which the following is a completely specification thereof:

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a door with a viewing window for a microwave unit and, more particularly, to a door with a viewing window for a microwave unit, which comprises a metallic door frame, two glass panes held spaced from each other between the metallic door frame and a metallic screen for screening or blocking microwaves arranged between the glass panes, which is in conductive contact with the metallic door frame.

2. Description of the Related Art

Doors for microwave units typically have a viewing window, in order to be able to better observe the cooking process in the microwave unit. This viewing window comprises two glass panes arranged spaced apart from each other in a metallic frame. The glass panes are made from a high temperature-resistant glass. Since this glass is also transparent for microwaves to some extent, a screen is necessary in the metallic frame to block microwave radiation in the vicinity of the viewing window.

In the known microwave units this screen comprises a blackened perforated metallic plate, which is rigidly attached in the space between both glass panes and is in electrically conductive contact with the metallic frame. This comparatively heavy perforated metallic plate of course blocks the microwave radiation to the required extent, however it significantly impairs observation of the interior of the microwave unit.

SUMMARY OF THE INVENTION

It is an object of the present invention to construct the microwave unit door
5 in regard to the metallic screen, based on the above-describe microwave unit
door with viewing window of the above-described type, which comprises a
metallic door frame, in which two glass panes are spaced from each other, and a
metallic screen for blocking or attenuating microwaves between the two glass
panes, which is in conductive contact with the metallic door frame, so that, on the
10 one hand, the metallic screen provides the required blocking or attenuation of the
microwave radiation, which means that the legally required limit for emission of
microwaves from the microwave unit is not exceeded, and, on the other hand,
the metallic screen does not impair observation of the interior of the microwave
unit from a practical standpoint.

15 This object and others, which will be made more apparent hereinafter, are
attained in a door with a viewing window for a microwave unit, which comprises a
metallic door frame, two glass panes held spaced apart from each other between
the metallic door frame and a metallic screen for blocking or attenuating
microwaves arranged between the glass panes, which is in electrically
20 conductive contact with the metallic door frame.

According to the invention the metallic screen comprises a woven fabric of
thin metal fibers, which are woven together with a predetermined small spacing.

This fine woven fabric, as experimentation has shown, blocks or attenuates the microwave radiation to the required extent and surprisingly allows a practically completely unblocked or unveiled view of the interior to the microwave unit. There is practically speaking no noticeable blocking of the view.

5 The term "thin metal fibers" within the sense of the present invention means metal fibers each with a thickness in a range from 0.02 mm to 0.1 mm, preferably about 0.06 mm.

The predetermined small spacing between metal fibers, i.e. the distance between opposing sides of adjacent individual metal fibers, is preferably in a
10 range of 0.09 mm to 0.5 mm and amounts to about 0.12 mm in a preferred embodiment.

In the simplest case the woven fabric has a so-called linen or plain weave, in which the warp fiber or thread alternatively passes over and under the weft fiber or thread. Also other weaves of the fibers, for example, a body weave, are
15 of course conceivable.

So that the thin metal fibers have sufficient tear resistance, the metal fibers preferably comprise steel fiber.

In order to avoid light scattering effects, the woven fabric, as in the known case of the perforated plate, is blackened.

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BRIEF DESCRIPTION OF THE DRAWING

The objects, features and advantages of the invention will now be illustrated in more detail with the aid of the following description of the preferred

embodiments, with reference to the accompanying figures in which:

Figure 1 is an exploded perspective view of a door with a viewing window for a microwave unit according to the invention, showing the structure of the door; and

5 Figure 2 is a horizontal cross-sectional view through the door shown in Fig. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The door shown in the drawing with a viewing window for a microwave
10 unit has a metallic frame 1, in which two glass panes 2,3 are held spaced from each other. The glass pane 3 closest to the unit interior I is preferably made of glass sold under the trademark DURAX®, while the glass pane 2 closest to the surroundings or outside O is preferably made of glass sold under the trademark BOROFLOAT® or DURAX®. The glass panes 2,3 are glued in the metallic
15 frame 1, preferably by means of an adhesive 4.

To screen off or block microwave radiation in the vicinity of the viewing
window a metallic screen 5, comprising a woven fabric of thin metal fibers 5', preferably steel fibers, is provided. The thin metal fibers 5' of the metallic screen are woven together with a predetermined small spacing. Preferably the metal
20 fibers 5' are woven together in a so-called basket weave form, in which the warp fibers alternately pass over and under the weft fibers. This metallic screen 5 comprising the woven fabric is mounted on the inner side or inner surface S of the inner glass pane 3 facing the outer glass pane 2.

The metallic screen 5 comprising the woven metallic fabric used for screening has a very fine weave, which for example is also used in oil filters for motor vehicles. The thickness of each of the metal fibers 5' is in a range from 0.02 mm to 0.1 mm, preferably about 0.06 mm.

5 The spacing d of the opposing sides of adjacent metal fibers 5' from each other is in a range of 0.09 mm to 0.5 mm, preferably about 0.12 mm.

The woven metallic fabric used as the metallic screen 5 according to the invention is black because it is made from metal fibers 5' that are black or it is subsequently blackened.

10 The invention can basically be used in all units, in which a viewing window is provided and a screen for electromagnetic radiation is arranged in the viewing window.

The disclosure in German Patent Application 102 50 298.6-16 of October 29, 2002 is incorporated here by reference. This German Patent Application
15 describes the invention described hereinabove and claimed in the claims appended hereinbelow and provides the basis for a claim of priority for the instant invention under 35 U.S.C. 119.

While the invention has been illustrated and described as embodied in a door with a viewing window for a microwave unit, it is not intended to be limited to
20 the details shown, since various modifications and changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it

for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention.

What is claimed is new and is set forth in the following appended claims.